ANNUAL ADDRESS OF THE PRESIDENT,

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Delivered November 6, 1883.

HUMAN EVOLUTION.

THE SOURCES OF HUMAN HISTORY.

The story of human evolution is the essence of the history of mankind. Knowing what man is and does, the inquiry arises, How came he thus to be and so to do? The reply is history, and its sources will be briefly characterized.

I.—GEOLOGIC RECORDS.

From the science of geology we learn that strata of rocks are constantly forming. The rains wash down the hills and deposit a part of the materials in the valleys and carry another part into the lakes and seas. During this process the bones and shells of animals are buried; and the bones of man and the implements of his art are buried with them.

There have been tribes of men who, unable to construct habitations for themselves, sought shelter in caves, where they lived and died, generation following generation. In such caves they gathered their rude works of art, together with the bones of the animals that furnished them food. Thus it came that the osseous remains of men, together with the works of their hands and the bones of the animals sacrificed to their hunger, were buried in the natural accumulations of the caves, and now they may be exhumed as subjects of study.

There have been tribes of men living on the banks of rivers or on the shores of the seas who brought to their rude habitations the denizens of the waters—the fish, the crustacean, and the mollusk. Within and without their dwellings bones and shells accumulated from year to year and from century to century. To such savage peoples this material was not offensive refuse, and so to them no

thought of removing it occurred. It therefore accumulated. As their simple dwellings were reconstructed from time to time, they still surmounted the accumulations gathered from the waters and the lands. By this process shell-mounds were raised, and in them were buried the bones of the land animals and of the birds of the air. From time to time the implements used by the people were lost and buried in the same refuse-matter; and sometimes these ancient peoples buried their dead beneath their houses. In such shell mounds, therefore, stores of valuable historic materials can now be discovered.

There have been tribes of men who buried their dead in the earth, and placed in the graves the possessions of the departed and many pious offerings, and sometimes erected huge mounds of earth thereon; and now skeletons, possessions, and offerings are exhumed.

There have been tribes of men who built their habitations over the waters of lakes, and these structures fell and were buried by lacustrine sediments; and now the ancient lake-dwellings can be studied.

There have been tribes of men who erected habitations on the flanks of slumbering volcanoes. Mountains heed not the welfare of man, and when the volcanoes were aroused men and their homes were buried. Under such formations the remains of man and the works of his art are entombed.

Tribes of men have made their homes under overhanging cliffs, using the natural caves of the rocks as part of their habitations, and constructing external walls of stone. Such cliff-dwellings have finally fallen into ruins, and have been more or less buried by the disintegrating rocks falling from above. Other peoples have built towns and cities of stone or clay, and the winds have drifted the sands over their ruins. From such buried cities valuable historic materials are exhumed.

II.—Designed History.

Whenever man has acquired a written language, of pictographs, ideographs, syllabaries, or alphabets, he has made records for a variety of purposes. This designed history is not composed solely of accounts of what the writers themselves saw, or what they learned from contemporaries, but it also includes that which had been re-

ceived by tradition. Anterior to the development of writing, man exercised his memory in the preservation of history to a greater extent than now, so that historic events were transmitted from generation to generation by tradition with an accuracy of diction surprising to civilized man. This designed history is in many ways imperfect, being vitiated in part by ignorance and in part by design, as to a large extent the purpose of such history was laudation or the advocacy of measures. But, as much of history has been written by many persons, and the same events have thus been recorded from diverse standpoints of opinion and interest, critical comparative study reveals much truth.

III.—Undesigned History.

Since the invention of writing, very much of history has been undesignedly recorded. Early records of this class are largely poetic. Many deeds designedly told have been rhetorically illustrated by fragments of history—statements of facts in which the writer had no motive for misstatement but all motive for the expression of the truth. Such history appears under a variety of forms—mythic accounts of creation, accounts of the ceremonial institutions of religions, and narratives of the adventures of heroes, into which are woven statement of the manufacture and use of weapons and other instruments. Accounts are given of the councils of people, in which the statements made by persons taking part therein recount the doings of their ancestors; and one of the earlier uses of writing was that of recording codes of laws by which societies were regulated. All of these records undesignedly written as history prove to be of the greatest value to the scientific historian of the present epoch. The records themselves are not vitiated. Their value depends on sound interpretation.

IV.—Comparative Statics.

The study of mankind as he is, without reference to what he has been, is sometimes called Social Statics. When we learn what man is and does, as he is represented among civilized, barbaric, and savage nations and tribes, and compare the statics of each society with every other, and arrange them in order from the lowest savage tribe to the highest civilized nation, it is discovered that a series of conditions appears, parallel to the series of conditions derived from

geologic records, designed history, and undesigned history; so that the history of the progress of any people from savagery to civilization is found to a large extent similar to an account of existing peoples, beginning at the lowest and passing to the highest. When the scientific historian is in doubt about the course of events among the people whom he is investigating, he turns to comparative statics to discover what it teaches as a guide to his researches. In like manner the student of comparative statics finds corroborative evidence of his truthful conclusions in the writings of the scientific historian.

Such, in brief outline, are the sources of history. From them an intelligent account of the progress of man, from an early period of his existence upon the earth until the present time, has already been derived. True, all is not known. The future scholar will discover that what is now written is imperfect; but that which is known is of profound interest, and contains lessons for human welfare that mankind cannot ignore.

THE EARLY CONDITION OF MAN.

From the geologic record it is ascertained that man lived in late Tertiary times. In early Quaternary time he is found widely scattered throughout the earth, for his bones are discovered in the Tertiary or Quaternary rocks of every continent. By the laws of evolution, now postulated in all sound scientific research, it is inferred that he existed as a highly differentiated animal long anterior to that time, and it is confidently believed by anthropologists that geologic research will eventually demonstrate this inference. Be that as it may, man was widely distributed in the first part of Quaternary time. Now, science has not yet established a method for measuring geologic time in the units of recorded history—in years, though some attempts of this character have been made, and important conclusions have resulted therefrom. It is sufficient here to say that Quaternary time must be measured by scores, or hundreds, of thousands of years. The remains found exhibit the fact that at such time as they were deposited the human beings to which they belonged were highly developed as compared with the most advanced of the lower animals existing at the present day, and yet that they were less advanced than the lowest of men existing now,

and much lower than man in his highest estate. All this comes from the geologic record. In the same manner the comparative anatomy of the peoples of tribes and nations still existing exhibits the fact that savages are physically much more like the lower animals than are civilized men.

In geologic formations of the same age as those in which the first human remains are found, many implements are discovered, fashioned by man and used by him for a variety of purposes. These tools, in the materials of which they are made, in their fashioning, and in their uses, exhibit a very low state of culture, for we here discover the very beginning of the arts in the use of rudely shaped stones, fragments of bones, and shells. Now these rude works of art—stone hammers, stone celts, shells and fragments of shells, bones and fragments of bones—are scattered everywhere throughout the habitable earth, and therefore it is certain that when man began the invention of arts he had occupied the whole earth.

In the study of the institutions of mankind, it is discovered that as we go backward in the recorded history of the civilized races, or go downward in the scale of peoples from civilization to savagery as these peoples exist as tribes and nations upon the earth, such institutions, through which society is organized and regulated, have passed through a series of stages, such stages becoming more and more simple as we go backward and downward. First it is noticed that the structure of bodies politic, *i. e.*, the plan of organization, changes by becoming more simple and by presenting characteristics which manifestly include less and less numbers in each corporate body or state, be it national or tribal; so that the earliest forms of states, from the very nature of their structure, could not include large bodies of people. As we pass back in civilization the smaller becomes the nation. As we still pursue our investigation through barbarism into the lowest savagery, the smaller becomes the tribe. This leads to the conclusion that in the early history of mankind there was a vast multiplicity of tribal states.

The condition of primitive man is also discovered in the study of languages. In the early history of philologic research it was assumed that the thorough study of languages would result in tracing them to a common stock. For a time, as the languages of the more civilized peoples were studied, this earliest hypothesis rapidly gained credence, from the fact that the languages of the more

civilized peoples were thus traced to a common stock—the Aryan. But, as research was widened, and the languages of more diverse peoples were studied, new groups were established on as firm a basis as that upon which the Aryan rests. As investigation progressed from decade to decade, these stocks of languages rapidly multiplied, so that a very great diversity of original stocks or families of languages is now recognized. But there is yet a further stage in this line of research. It is shown that every such group of languages in the course of its history borrows to a greater or less extent from others. Sometimes this borrowed material can be traced to other stocks known to exist. Much of it cannot be thus traced, and it becomes highly probable that many linguistic stocks have been so far lost that only these fragments, these waifs of language, remain to give hints of their existence. It is thus shown that languages have had a multiplicity of origins; and it is further shown that languages, in the earliest stages of which we have knowledge, were very imperfectly organized—that is, they were very crude tools for the communication of thought.

A philosophy is a system of opinions concerning the phenomena of the universe which the people entertaining such opinions have observed. If we take the history of any civilized people from the earliest record to the present time, it will be observed that the philosophy of such a people has changed in every stage of progress. If, on the other hand, the philosophies of different peoples, civilized, barbaric, and savage, are studied, it is discovered that the course of evolution observed is parallel with the series of philosophies obtaining among existing peoples. Certain important characteristics are observed in these philosophies; namely, that the philosophies of civilized peoples are highly unified; that as we go backward in their history they become more diverse; and finally, when we study the earliest philosophies, together with the philosophies of the lowest tribes of mankind, we discover that there is a vast multiplicity of systems of opinions; that each such system of philosophy becomes the supposed explanation of the phenomena of a small district of country which was to some little tribe the whole extent of its universe. In this manner it is discovered that in the earliest stage of opinions there was a vast multiplicity of philosophies.

It will thus be seen that from five great co-ordinate departments of anthropology, *i. e.*, from somatology, or the biology of man;

from technology, or the science of the arts; from sociology, the science of institutions; from philology, the science of languages; and from philosophy, the science of opinions, we arrive at the common conclusion that man was widely scattered throughout the earth at some early period in his history in a very low state of culture; that in such state he utilized the materials at hand—the loose stones of the earth, the bones scattered about, the shells stranded on the shores, the broken trunks and branches of trees, and whatever would most immediately come to hand without ingenuity and without toil. And we further discover that he was organized into small tribes, doubtless scattered by every bay and inlet of the seas, along the shores of all the inland lakes, on every bend of the great rivers, and on every creek of the habitable earth. Man thus scattered had not yet acquired organized speech. Doubtless he had rude language, or he could not thus have spread through the earth, the lord of the fowl and the brute; but organized oral speech began at a multiplicity of centers, with each little tribe of the earth. With speech, into which opinions could be molded, began the growth of philosophies. Arts, institutions, languages, and philosophies have therefore a vast multiplicity of origins, and in tracing the outlines of their history we trace the change from multiplicity toward unity.

Before proceeding to describe the nature of this change it will be well to take a general glance at man as an animal. It appears that at this early time, as man was spreading from some center throughout the earth, the laws of biotic evolution were in force, and there had resulted therefrom much biotic specialization, for man was yet but the highest of animals. This specialization had resulted in the establishment of varieties, exhibited in the color of the skin, the structure of the hair, the position of the eyes, the conformation of the cranium, and other biotic peculiarities. Had the laws of biotic evolution continued paramount, it cannot be doubted that these varieties would steadily have become more and more pronounced, and the genus *homo* would ere this have included many species. But through the evolution of arts, institutions, languages, and opinions, the laws of biotic evolution, though perhaps not absolutely repealed, were superseded by other methods and laws which changed the course of man's progress. By the spreading and admixture of activities, and by the concomitant admixture of streams of blood varieties were prevented from becoming species. The tendency

to heterogeneity of species was checked, and a tendency to homogeneity was established.

Having thus briefly set forth the early condition of man, it is proposed to describe the course and method of human evolution thenceforth. Up to the time which we are now considering, man's history was the history of the animal man, but when man became superior to the lower animals his course of progress depended no longer on the laws of biotic evolution, namely, the survival of the fittest in the struggle for existence, through the fact that by reason of his superiority he no longer came in competition with the lower animals; he then used animals and plants alike for his own purposes. A new method of evolution arose. Animals under the laws of biotic evolution were adapted to the environment; man, through his activities, adapted the environment to himself; and through these activities men became organized; and thus there is a third kingdom of matter, of which the science of anthropology treats. The origin and nature of these activities will now be set forth.

THE GENESIS OF ACTIVITIES.

The Mind.

In biotic evolution a special organ is developed to regulate the interdependence of the other organs as they perform their functions for a common purpose—the welfare of all. This organ, itself a complexity of organs with differentiated functions, becomes also the organ of communication between the individual and his environment. At first the means of communication are tactual. Out of the general tactual sense the more specialized sense of taste is differentiated, having a limited set of nerves for its organs. Another differentiation of touch is the sense of smell, by which certain properties of exceedingly minute bodies, emanating from larger, are perceived. Then comes another differentiation of tactual perception, in the evolution of an organ so delicately constituted as to detect minute vibrations of the air—the sense of hearing. And finally an organ of tactual sense is developed, so exceedingly delicate as to perceive those vibrations of the ether called *light*. Thus the five senses are differentiated out of the general tactual sense, each having more highly specialized organs in the order in which they have been named.

As the functions of biotic organization are performed through the transmutations of matter and motion and the passing on of the constituent matter from one stage to another until it entirely passes from the living body, having been replaced from stage to stage by new constituent matter, the impressions which the senses receive from the exterior are imposed upon the structure, as the old leaves and the new takes it places. In this manner each minute structure within the body is in part the same as the antecedent structure and in part changed therefrom by the force of impressions from without. It is in this manner that impressions are recorded, so that the structure itself is a product of all co-existent and antecedent agencies. Out of this arises Memory.

First, then, an organ is developed for receiving impressions from without, to be used in regulating the functions within; and this becomes highly specialized, so as to receive a vast multiplicity of impressions. Then, by reason of the nature of vital functions, a record of such impressions is preserved, and mind results therefrom. Objective impressions are transmuted into subjective sensations and perceptions. Mind weaves them into emotions and thoughts, and men are thereby propelled into other activities. An organ or system of organs for the mind is discovered, more or less highly developed, in the lower animals, but its great development is found in man. The science of the mind is Psychology.

The Arts.

In the biotic kingdom activity first appears among plants, and its inception has been denominated *Circumnutation* by Darwin, the greatest of biologists. Then follow various movements, all of which are usually included under the general term Sensitiveness, exhibited in a great variety of ways among plants. This effort of the plant, under varying conditions of environment, to gain the advantages of the more favorable, results in movements that are here called *Activities*. It is thus that plants become actors.

Activities of a higher order appear among animals. Such as are fixed reach out their tentacles for food; such as are free have locomotion, and they seize their food as do fixed animals. In this manner animals become subjects, or actors, doing that which they will or design. They seek shelter from the storm, or purposely bask in the sunshine. Then they prepare shelters for themselves,

provide ways or devices for procuring food and for escaping dangers, and in a great variety of ways perform acts.

In doing such acts animals are said to *work*—they perform operations. But in passing from the lower animals to mankind we find that these operations are greatly multiplied and diversified. This arises primarily from a higher differentiation of the human organisms. Through arboreal life and the activities concomitant therewith, under the well-known laws of specialized development, hands were evolved—special organs for operative functions. Thus, out of biotic function were evolved those activities which will here be denominated *Opcrations;* and the evolution of operations is the evolution of art. The science of the arts is Technology.

INSTITUTIONS.

Low in the scale of animal life bilateral symmetry appears. The lower animals are characterized by a multiplicity of like organs for the performance of the same functions. In the loss of this multiplicity and the development of special organs for special functions, there were gradually evolved duplicate sets of organs performing like functions. These duplicate organs are so adjusted as to render each other important assistance. Not all the organs are thus duplicated. In general it may be said that those specially engaged in alimentation are single. Those whose functions mainly relate to activities in the external world are double and co-operative. Vision is greatly facilitated by duplicate eyes, hearing by duplicate ears, manual operations by duplicate hands, and locomotion by duplicate feet. To an important extent, therefore, the animal organism is an association of two sets of like parts, co-operating for common purposes. The next step in the higher organization of animals is also biotic. This consists in the differentiation of the individuals of the species into male and female for bi-sexual reproduction. Without this peculiar biotic differentiation the individuals of the species would have been discrete. Each individual would have been the competitor of every other, and there would have been no genesis of co-operative association; but bi-sexual differentiation became the basis of co-operation at the foundation of life. Having thus become associated into more or less coherent groups, there were gradually developed therefrom co-operative activities in many ways. There was co-operation in obtaining food, in securing shelter, in

warning from danger, in destroying enemies; and this process in the evolution of association has continued until many, perhaps all, of the more highly organized animals have acquired social institutions more or less crude.

Among some of the lower animals a further biotic differentiation progressed *pari passu* with a further specialization of activities. This is seen curiously exhibited among bees and other species of the articulates; so that their higher social organization is a concomitant of biotic differentiation. But among the vertebrates biotic differentiation did not proceed further in conjunction with operative differentiation. Along with the differentiation of operations a special class of employments sprang up, having as their function the regulation of the conduct of the individuals associated. This was the inception of government. Government, then, is the specialized activity of regulation. In a crude manner, and to a limited extent, many of the species of the lower animals have developed this specialization of operations, and have further developed the rudiments of that special activity here known as *Government.* But the operative activities have their highest development among mankind. Through them society is organized by the differentiation of many arts and the establishment of interdependence therein, and especially by the growth of the operative activity known as Government, by which all other operative activities are regulated. This gives the science of Sociology.

Language.

In the biotic process of evolution the senses were developed, and by them more delicate communication between the subject and the environment was established. In the association of individuals which arose from sexualism this delicate communication between the individual and the environment was further developed into communication between individuals. The biotic organism, through its most highly developed organic part—the nervous system—having become able to perceive the characteristics of the natural environment which immediately affected its own existence and welfare, became competent also to interpret certain of the characteristics or attitudes of the individuals of the environment with whom there was constant association; and individuals perceived that their own attitudes were thus discovered by changes effected thereby in the

attitudes of others. In this manner, by minute increments of knowledge, each learned something of the other with whom he was associated, and each learned to communicate with the other, *i. e.*, to assume attitudes designed to influence the other. Through this intercommunication language was developed. The senses became the passive organs of language. Attitudes of the body developed into gestures, and sound-making into oral speech, and the active organs of language were specialized; and finally, oral speech to a large extent superseded gesture speech. Languages are developed among the lower animals, but their chief development appears among mankind, and by it men became associated in thought. The consideration of these linguistic activities belongs to the science of Philology.

Opinions.

Combined and compounded thoughts produce opinions. Through the evolution of language, opinions are transmitted from individual to individual, so that the perceptive experiences of one come to be the common property of many. Through the law of heredity, opinions, or the elements of which they are composed, are transmitted. Opinions, therefore, are derived from ancestors, from personal experience, and from the experiences of others communicated by language. Through all of these processes opinions rapidly multiply, and by their interaction they are changed in quality. Organized opinions are philosophies. A few crude opinions are held by the lower animals. They come to believe that certain things will do them harm, others good; that certain attitudes of living beings are indices to their intentions. But a much higher development of opinion is discovered among mankind. The science of opinions is called Philosophy.

It will thus be seen that five great classes of activities are recognized, under which all human actions may be grouped. In the first are embraced the activities of the Mind in transmuting objective impressions into subjective sensations and perceptions, and the compounding of the elements of thought into the formation of opinions. In the second are embraced the operations of mankind in supplying his wants. These are the Arts. Third, the activities of mankind that lead to the organization of societies. These are the Institutions. Fourth, the activities of intercommunication be-

tween mind and mind, embraced under the general term Language. Fifth, the activities of the mind in combining the more simple opinions into the more compound, producing Philosophies.

Thought has necessarily been used as the name for units of different orders. The term *opinion* has been used in a like manner. The ultimate product of thought is opinion; the ultimate product of opinion is philosophy. In the same manner *institutions* and *arts* are each used to designate units of different orders. Psychic activities are subjective, being states of the mind; objective activities produce arts, institutions, languages, and opinions. All have their genesis in biotic functions. All are observed among the lower animals. All receive their highest development in man. In their evolution they act and re-act upon each other, so that in their progress there is an ever-increasing interdependence. Through their evolution the biotic organs on which they are dependent are developed, or specialized, by exercise. The evolution of mind, therefore, is dependent upon and proceeds with the evolution of arts, institutions, languages, and opinions, and its history is their history. The course and methods of anthropic evolution must be ultimately sought in the history of activities.

The doctrines of biotic evolution are now woven into the speech of common life. They need not here be recapitulated. The evolution of man up to the time of his acquisition of organized activities is fully set forth in those doctrines. Since that time the course and method of his evolution have been radically changed.

EVOLUTION OF ARTS.

The arts of mankind begin with the utilization of the most accessible materials in the natural environment. Clubs are made of wood, various instruments of percussion of stone; shells are used as domestic utensils, and the skins of animals as clothing. Then man learns to fashion his clubs, to fashion implements of stone, bone, and horn, and to add to his utensils of shells plaited woodwork, as trays and baskets. Then he learns to fashion and bake clay for domestic utensils. Such rude arts began at innumerable centers, at every home of a primordial tribe; and the arts at first, arising from utilization of the materials immediately at hand, were controlled by the immediate environment. Tribes living in forests made shelters of wood, and improved them from time to time.

Tribes living in more arid regions, where wood was scarce and rocks were scattered upon the surface of the earth ready to hand, made their first shelters, and subsequently their more highly developed habitations, of stone. Tribes that lived on the fens of rivers and the low shores of lakes utilized reeds as the materials for their shelters and habitations. In a multitude of ways this fact could be illustrated, that the most accessible materials in each center of the development of arts controlled at first the nature of the arts themselves. From this condition progress was steadily made, in using first the materials and secondly the powers of nature, until multitudes of arts sprang up. In the arts of sustentation, from hunting, fishing, root-digging, and the gathering of fruits and seeds came agriculture. Then followed the domestication of animals, and finally man employed beasts of burden. In the arts of transportation by water, first logs and rafts of logs and rafts of reeds were used. Then logs were hollowed for boats, and reeds were constructed into similar craft, and boats were made of bark. At first boats were propelled by paddles, then by oars, and then by sails. And finally beasts of burden came to be extensive agencies for transportation. Then trails became highways, and then first some tribes became nomads. The story would indeed be long were it all told; only the briefest illustrations are necessary.

In the early history of the arts tools were used, and tools developed into machines as device was combined with device. Tools and machines are used in art operations, such as agriculture, house-building, cloth-making. Each operation or distinct art is composed of processes, and each process has its corresponding tool or machine. With the evolution of implements, composed of tools and machinery, there is an evolution of processes—the functions of machines; and through the evolution of processes and implements the arts themselves are evolved. As processes and machines have gradually become interdependent in each art, in like manner interdependence has been established among all the arts. Agriculture has become dependent upon manufactures for agricultural implements; manufactures have become dependent upon mines for the materials used therein; agricultural arts, manufacturing acts, and mining arts have become dependent upon the arts of transportation to bring the materials together and scatter the products to the places where they are to be used. There is thus established among all arts throughout the civilized world a

vast plexus of dependencies, so that the operations of each art are dependent upon the operations of other arts; and with every differentiation of a new art the interdependence increases.

Thus it is seen that man in his invention has developed the arts. In the course of invention each artifice has been the prelude to some other artifice, each process to some new process. Each device with its process is a step in an ascending series. As better processes and implements are invented, old processes and implements are discarded. The good is constantly being replaced by the better, and the better by the best. The better is chosen, the worse rejected. A pyschic activity of choice intervenes, and the method of progress by human selection is established as distinguished from natural selection. Thus again we have a survival of the fittest; and it should be noticed that it is a survival of the objective art, not of the subjective artist. Progress in the arts, therefore, is made by human invention and selection, and the invention and selection alike are the work of—not one man, but all men.

Man in his highest estate in modern civilization has developed a vast multitude of arts, and through them he controls the natural environment in such a manner that no longer is he beaten by the winds and driven by the storms and starved by the deserts; no longer is he the abject creature of physical changes—the environment is now controlled by himself. Being an actor, he determines his own progress and is master of his own destiny.

All the arts are man's inventions—not of any one man, nor of a few inventors appearing at long intervals from time to time as great benefactors, but all mankind have been inventors. The body of arts to-day existing in civilized society has grown up by minute increments, from the days of the club and the shell to the days of the engine and the loom.

As the arts are expressed in material nature they can be easily imitated and learned. From their very nature they readily spread from man to man, from tribe to tribe, and from nation to nation. Again, as arts are developed for the purpose of supplying the wants of man, the impulse to imitate and borrow is the most pressing. Whenever arts have been developed they have rapidly spread, so that that which one man has done has been a boon to many, and what each man has done has been a boon to all. It is thus that the whole world is engaged in the invention and spread of

the arts; and when we contemplate their vast development, the extent to which man has gained control over the materials and powers of nature, the magnitude of the result is equaled only by the magnitude of the agencies that work therein. The arts are the inventions of all mankind, from the days in which man lived in equality with strange beasts that have perished until the present when the earth is embellished by his hand. Art is the product of all labor through all human time.

EVOLUTION OF INSTITUTIONS.

As the simple arts with tools and processes developed into the complex and compound arts with machines and operations, men engaged in these labors were thereby made interdependent. Each one became dependent upon many others for the successful prosecution of his own calling. Farmers became dependent upon manufacturers for machines, manufacturers upon miners for materials, miners upon farmers for food. In every stage of the progress of art, man becomes more dependent upon his fellow-man. The shoemaker can use shoes directly to supply only a single want, but, in the complex conditions of life which have been evolved, he has a multitude of wants, which press upon him at every hour of the day, and for the supply of each one he is dependent upon a multiplicity of other men, who are dependent upon him through the want for shoes. And so all civilized men are bound together by a plexus of cords, each one a want, and every man's happiness is dependent upon the happiness of others.

But while the dependence of man has been steadily increasing from early savagery to high civilization, his authority over other men has in like manner been increasing. While he is subject to other men by reason of his wants, other men are in like manner subject to him by reason of their wants. Man is therefore steadily becoming more and more a master and more and more a servant. With every stage in the progress of art, interdependence is increased. Thus men have become organized as arts have become organized.

With all this indirect organization arising through the arts, there is a direct organization arising through institutions. In the process of this evolution mankind has become associated into groups on various plans. The association of a group of individuals for any purpose whatever gives rise to an institution.

The primary grouping of mankind has its foundation in the biotic differentiation of the sexes, giving rise to the institution of marriage, or co-operation for reproduction. This first group is composed of husband and wife, parents and children. Added to the biotic differentiation of functions is the anthropic differentiation of activities. Here is discovered the first division of labor; for while by necessity the wife and mother has the immediate charge of the offspring, the husband and father has the indirect care of mother and children in providing food and shelter therefor. It is only by a vague inference that the characteristics of this institution in its earliest form are known; but it seems probable that the association of individuals in marriage was more or less ephemeral, continuing for longer or shorter periods entirely at the will of the individuals immediately concerned. Be the beginning what it may, the later history of the institution is well known, and some of the important facts relating thereto will hereafter be set forth.

When a group of individuals engage in dancing, their actions are correlated, and an organized dance—for example, a cotillion—is an early form of institution. Such an institution is exceedingly ephemeral, as it lasts only while the activity is in progress; but it becomes more permanent in very early societies, as dancing associations are formed. Such associations are composed of members who cultivate a particular dance, and who meet from time to time for the prosecution of the activity from which they derive a pleasure, and which to them has a mythic significance. These institutions are very common among the lower tribes of mankind, and constitute an important element in the structure of the tribal state.

In early society it is discovered that associations are formed for hunting. Groups of men engage in this activity by enclosing game and driving it to a central position as the members of the group themselves converge. Among many tribes pitfalls are constructed and winged barriers of logs, brush, or rocks adjusted thereto, to aid in guiding the driven game. For smaller animals nets are constructed, as snares into which they are driven. Such an association is an institution in its most primitive form and may be quite ephemeral, lasting only for a single hunt. But pitfalls, barriers, and nets may be used again on the same field, as from time to time during the season, and from year to year, the institution is revived. Then the individuals who take part therein often become more permanently organized into societies,

so that there will be a society for the hunting of the buffalo, another for the hunting of the deer, another for the hunting of the rabbit.

In like manner institutions for the practice of occult medicine arise. Medicines or charms are prepared with elaborate ceremonies, and virtues are implanted therein through the use of mysterious words accompanied by dancing, singing, and the performance of strange rites. Sometimes the association for this purpose is ephemeral, but usually it is found that permanent societies are organized, each having the care of the systematized rite and the custody of the medicine.

So institutions for the practice of religious rites and the performance of religious duties arise in early society, and continue on in various forms through civilization. Institutions for the prosecution of war are also organized. In early history war parties are societies. By their further development armies are organized.

As man progresses, institutions multiply. In a variety of ways men are organized into groups, or bodies politic, in each case for some specific purpose. Farmers organize agricultural societies, mechanics organize trades-unions, manufacturers organize their associations. Then those bodies usually denominated *corporations* spring up, and groups of men are organized to prosecute a specific industry, as a gas company, composed of stockholders, officers, superintendents of various grades, and employes. Schools are organized, composed of principals, teachers, and pupils. Churches are organized with a hierarchy of officers and laymen. In a vast multiplicity of ways these institutions spring up, and the same individual may become a component unit in many institutions. For convenience, all such institutions as have been here described, and which are designed to promote the prosecution of some enterprise, will be called *Operative Institutions*, to distinguish them from the class next to be described.

There is a special class of institutions that arise among men, designed for the regulation of conduct. The institution of marriage gives rise to the institution of the family. The necessary elements, parents and children, constitute a group of persons, and for their association authority and subordination are established. In the early history of society such groups coalesce into larger groups. Thus a group of brothers marry a group of sisters. The men are common husbands to the women, who are wives in common. Their

children call one another brother and sister, though they may be but half brothers and half sisters or cousins. In order that men may live together in such a body politic there must be some method for the regulation of conduct, and this regulation is accomplished by the establishment of authority and subordination, upon the basis of relative age; and in early languages a peculiar linguistic device springs up by which relative age is expressed in the terms of kinship by which the individuals of the body politic address one another. In these larger bodies regulation applies only to those particulars that lead to disagreement. It appears that the first sources of disagreement arise from the marriage relation. Men desire more or other wives, women more or other husbands. Discovering that the conflicts arising therefrom lead to the destruction of happiness, plans are made by which such disagreements may be obviated. A body of people geographically contiguous, and united by a common but crude language and by common but crude operative institutions, segregate into groups. The men who hold their wives in common and the wives who hold their husbands in common establish an institution by which their children may more effectually avoid conflict and be more thoroughly organized for mutual assistance. This is done by segregating the children into groups—two or more groups of young men and two or more of young women. Then these groups are related to each other by rules or laws established by the elders, to the effect that one group of young men shall call one another brothers, and shall have a group of the young women as their wives in common. The sisters of the young men shall be the wives of another group, that second group being the brothers of the wives of the first. Thus the little tribal state is bound together by ties of affinity and consanguinity. Now this plan of structure of the early tribal state develops in many ways, through many curious institutions of marriage and of the family; but always in the early history of mankind the body politic is based upon kinship.

The later forms of this political structure appear in the clan or gentile organization exhibited among the Indians of North America and many savage and barbaric peoples elsewhere throughout the globe; and it appears among our own Teutonic forefathers. Perhaps the gentile organization had its highest development among the Greeks and Romans. This kinship structure of society was well adapted to peoples scattered widely throughout the earth, each

having its own language, and to a greater or less extent its own system of arts and operative institutions. An important characteristic here to be noted is that it is adapted only to small bodies of men, who are able to keep in memory and recognize all the individuals belonging to the state, and to address them by their proper terms of kinship.

The highest form of this society in its simplicity is the patriarchy, and through it ancestral worship is established. In all the history of kinship society the course of progress is such that classes, clans, gentes, and higher groups of these are differentiated and integrated always to one end, namely, that a larger body of people may be brought into one regulative institution or state.

At last kinship society broke down; it no longer served the wants of the people as a method of organization; and slowly with its collapse a new system of organization was developed—that based upon property; and as land was the most important property, states came to have a territorial organization. So tribe coalesced with tribe, and nations were organized; and through barbarism, which is the transition state, savagery developed into civilization, tribes into constitutional nations.

The evolution of "Operative Institutions," as they have been denominated, will here be neglected, and attention will be called exclusively to the course and method of evolution of Regulative Institutions.

Under these institutions we have to consider: the structure of the state, the constitution of the government, and the principles of the law.

The progress of evolution in the state is marked by a steady differentiation in the divisions thereof, and a relegation to each of some distinct function of government. On the other hand, the evolution is characterized by progressive coalescing of tribes into larger tribes and into nations, and of nations into larger nations.

In the evolution of government there is to be observed a progressive differentiation of function, as legislative, executive, and judicial; and in each of these great departments of government secondary and tertiary differentiations occur, while the whole system of government progressing from low tribes to highly civilized nations is marked by progressive integration in the establishment of relations of interdependence.

In like manner the law, composed of the rules of conduct which organized society endeavors to enforce, is evolved.

The course of the evolution of the state, the government, and the law was set forth much more fully in my last address to this society, and for that reason the subject will be neglected here; but the essential point to which all this explanation is directed is this: regulative institutions have been developed by mankind in the struggle to secure peace.

In order that men may live together in peace and render one another mutual assistance, institutions are invented. This is their purpose. The endeavor to secure peace has been by two parallel methods. The first is by the invention of institutions to terminate controversy, the second by institutions to prevent controversy; and while the two systems are never fully differentiated, the two ideas may always be discovered in the regulative institutions of a people.

In primitive society the institutions designed to terminate controversy are exceedingly crude, as a few illustrations will exemplify.

Among many tribes controversy must end at the Day of Jubilee. Again, if parties have resorted to personal conflict, controversy must end therewith. Thus results trial by duel. Trial by ordeal has a similar origin. It is simply, in its most primitive form, trial by lot, around which in time gather many ceremonies and religious sanctions.

Among the Muskokis, if a member is guilty of certain breaches of good conduct, complaint is made to the patriarch of the gens, who considers the case. By a curious legal fiction crime in these cases consists in conduct which transgresses the teachings of the patriarch. Therefore, when he considers the case he renders his decision by simply stating that he has or has not previously instructed the accused person not to do the things of which he is accused, and punishment is given or withheld accordingly, and controversy must end therewith. The law in such matters is manifestly composed of the teachings of the patriarch.

The endeavor to secure peace leads, through the centuries of history, to the recognition of the more delicate phases of justice, and especially to the methods of obtaining and weighing evidence, that the facts in controversy may be clearly understood and the decisions be based upon facts, and justice rendered thereby. So it has been in all the multitudes of tribes that have inhabited the earth. Every event in the history of a tribe which has caused serious disagreement or a breach of the peace, has been the subject-

matter of controversy by such a people. Around their camp-fires, in their council-lodges, in rude underground chambers where justice is administered, as well as in temples of justice where august courts deliberate—everywhere, human conduct has been the subject of discussion and deliberation. As the last product of all this endeavor there have been evolved codes of law and systems of jurisprudence. When we contemplate the struggle between passion and passion, between man and man, and the deliberation of the wisest and best of mankind among all peoples through all the period of the existence of society, we are filled with astonishment at the magnitude of the endeavor to establish justice. The vast systems of jurisprudence in the civilized world result from this endeavor.

But man has ever attempted to secure peace by preventing controversy. From time to time, as he has passed through the various stages of social progress, the immediate questions about which controversy has arisen have been the subjects of contemplation, and men have devised and counseled with one another in rudely or highly organized deliberative bodies for the purpose of formulating rules of conduct to secure peace, and this invariably ends in the consideration of the justice of rules of conduct. In the earliest forms of society the vigorous and able-bodied men, and sometimes women, meet from day to day or from time to time in council for the purpose of discussing conduct and establishing rules therefor. All along the course of the history of man we find that he has been thinking upon the characteristics of conduct that would secure justice, so that justice has been the subject of his thought everywhere and at all times. The forests of the world have echoed the eloquence of savage and barbaric orators as they have pleaded for justice. It is indeed impossible for the human mind adequately to comprehend the amount of thought and endeavor which has been put forth for the development of the modern structure of the state, the modern constitution of the government, and the modern system of jurisprudence; and it has all been the work of man—not of one man, but of all men.

THE EVOLUTION OF LANGUAGE.

Language is the agency by which men have been interrelated through the communication of thought. In the course of its evolution gesture-speech has gradually been replaced by the more highly organized oral speech; and finally written language has been based

thereon by representing to the eye symbols of that which is spoken to the ear. To a very large extent, in its earliest history, language was addressed to the eye. It then became chiefly addressed to the ear; and at last the eye and ear alike become the passive organs of speech.

For the present purpose, only oral language will be considered. It may be represented as composed of distinct sounds, each a syllabic emission. They are themselves complex, but they may be considered as the units of which speech is compounded. A few simple devices appear in the use of these syllabic sounds to express thought. First, syllables may be combined—two or more put together so that they coalesce in one word, or two or more words may be united to form one. This is the device of *Combination.* Second, the same particular syllable or word may be used in combination with many other words, in each case for the same or nearly the same purpose. Thus a particular syllable denoting time may be used with many words denoting action to give a time or tense qualification thereto. Often these added words or syllables become greatly worn, so that the orignal form is obscured or lost. There is a tendency to use such particular words in their original form, and more especially in their worn form, to a greater and greater extent as time progresses—that is, words in which they were not originally used come to have them attached by assimilation. For example, the past tense of *love* is *loved,* and it may be often noticed that children will use this same past tense with *go,* forming it as *goed* instead of gone. Thus, by wearing down of originally combined syllables and words, and by assimilation, systematic inflections are produced, and this device is called *Inflection.* Third, the syllabic units of language, as they have been described above, are composed of vocalic and consonantal elements. In some languages a mutation of the vocalic elements takes place. Thus in English, *man* in the singular is changed to *men* to express the plural; *run* is changed to *ran,* and *lead* to *led* for tense. This method, used to a very limited extent in English, becomes an important element in the structure of some languages, as the Hebrew. Sometimes, like inflection, it is but a modified form of combination; perhaps it is always so. Be its origin what it may, in some languages it comes to be a clearly differentiated device. It is called *Vocalic Mutation.* Fourth, the words thus constituted may be arranged in some order, so that such order

itself shall be expressive. This is beautifully illustrated in the case of the use of the figures of the Arabic notation, where the place of the figure is significant. This is the device of *Arrangement*, which I have elsewhere called *Placement*. Fifth, syllables and words may be expressed with peculiar intonations, such for example, as rising and falling inflections. In the English language intonation is chiefly used for rhetorical purposes; in some other languages, especially the Chinese, it is used to a much greater degree, and for other purposes. This is the device of *Intonation*. Sixth, particular words may be uttered with greater force than others for the purpose of calling attention to important ideas. This is the device of *Emphasis*. Seventh, stress may be laid upon particular syllables in words, and thus particular meanings may be given thereto. In English this is often done to differentiate parts of speech, as in rébel, the noun, and rebél, the verb. This is the device of *Accent*. In most languages combination and arrangement are the chief devices.

In the lower languages combination is chiefly used, and for a variety of purposes. Usually each syllable conveys a distinct idea, and by combining several syllables many ideas are expressed in one word. Such words, therefore, are not distinct parts of speech, but combinations of one or more. For example, in many languages there is no distinct word for *father*, but a word signifying *my father*, another *your father*, etc.; that is, a noun and an adjective pronoun are combined in one word. Again, there is no distinct word for *brother*, but a word for *my elder brother*, another for *my younger brother*, &c. Thus three distinct elements are found in one word. In this manner nouns, adjectives, and pronouns are undifferentiated. But it is the verb in which this characteristic is more distinctly exhibited. In such languages the verbs contain a variety of adverbial elements—first, of condition and time, giving rise to mood and tense, and second, of manner and place; each one a distinct adverbial element. Again, in such words the subject pronoun with its adjective qualifiers appears. So that in these lower languages a single word, usually called the verb, is a combination of many parts of speech. In such language, sentences are imperfectly developed, and this from the fact that the elements of a sentence, namely, parts of speech, are not clearly differentiated as distinct words.

There are many ways in which this synthesis or holophrasm of the lower languages is brought about. For example, the savage

falls into curious habits in counting, by expressing in words the complete act of counting. Suppose he is counting skins of animals, and in doing so places one on another until his collection is counted, While in the act of counting he says, "I put 1 on; I put 2 on; I put 3 on; I put 4 on; I put 5 on;" *pari passu* with the several acts. These little sentences expressive of the act, modified and cut short in various ways, come to be the names of the numbers applied to such objects as are counted in this manner. At another time perhaps he is counting arrows, and then his expressions will be, "I lay 1 down; I lay 2 beside; I lay 3 beside; I lay 4 beside; I lay 5 beside; I lay 6 beside;" &c. By constant exercise in this method of counting, the expressions for the act of counting come to be worn and used simply as the names of numbers for counting arrows and similar objects. In a like manner different series of names for the same numbers are developed and used in the counting of a particular class of objects, and they are therefore called by grammarians *Numeral Classifiers*. There is a great variety of ways by which holophrastic words are formed through combination; and the languages in which this characteristic appears in the most prominent manner are often called synthetic, holophrastic, &c.

In the progress of languages holophrastic words are worn out and eliminated, and in lieu thereof parts of speech are differentiated. Languages differ from one another in this respect only in degree; all are more or less holophrastic. To the extent that names express number and gender they are holophrastic. To the extent that pronouns express person, number, gender, and case, they are holophrastic. And to the extent that verbs express person, number, gender, condition or mode, time or tense, &c., they are holophrastic. In fact, the verbs, even of the highest languages, are not simple parts of speech. Should there come to be a language in which the parts of speech are wholly differentiated, there could be but one verb—the predicant. The verb *to be* in the English language is nearly such. By the differentiation of the parts of speech the sentence is integrated, and thus language is organized. Now progress in language is characterized by the specialization of the grammatic devices and the organization of the sentence.

The same device may be used to perform various functions, and various devices may be used to perform the same function. Complete specialization requires that there shall be but one function for a device and but one device for a function. To illustrate this in the

simplest manner, consider the methods by which the important word in a sentence is designated. In English this is mainly done by emphasis. In other languages the important word is put first or last; it is therefore designated by arrangement. In still other languages an important word is intensified by adding to it some other word or particle by which its meaning seems to be strengthened; this is by combination, a method frequently observed in Greek and Latin. Thus three devices may be used to perform the same function.

Again, combination may be used to strengthen words, as shown above. Combination may be used to qualify the meaning of a word—that is, a particle may be added to a word to change its meaning more or less. Something may be added to a word to express its relations to other words in the sentence—*i. e.*, the device may be used for syntactic purposes. Now, *ceteris paribus*, the grade of any language may be determined by its specialization of these devices. Again, the grade of a language may be determined, *ceteris paribus*, by the degree to which its parts of speech are differentiated, so that the simple logical sentence may be constructed therewith. Again, the grade of a language depends upon its sematologic content—*i. e.*, the ideas and thoughts which it is competent to express. Judged by these criteria, languages steadily progress from the lowest savagery to the highest civilization.

The brief statement which has been made is all that seems necessary for the present purpose, the object being simply to call attension to the fact that the course of evolution in language is determined. In the struggle for expression, language is invented, and it can be shown that the specialization of grammatic devices and the organization of the sentence are brought about by the survival of the economic in the endeavor to express thought. Language springs from innumerable centers, and, in general, progress has been toward unification. As the centuries of human endeavor have passed, languages have become fewer in number and more persons have spoken the same language. True, specialization has sometimes resulted in degradation, by the multiplication of different languages of the same stock; so that with much progress there has been some retrogression; but everywhere man has been endeavoring to communicate his ideas to his fellow-men, and the few languages that exist upon the earth to-day are the product of all the effort of all the people who have heretofore existed upon the planet. A language is as much an invention as is an art or an institution, but it should

be remembered that a language, as it exists at any one time, is the invention of all the people who have spoken it—an invention by minute increments, in the same manner as an art or an institution. Of the many languages that have been invented, of the many uses of the grammatic devices, and of the many words that have been coined, but few remain, and these are left because they have been chosen. The objective activity has progressed through endeavor and the exercise of choice upon the part of the actor—man.

EVOLUTION OF PHILOSOPHY.

Opinions are the units of which philosophies are composed. A philosophy is a system of opinions entertained by individual men or peoples relating more or less fully to all of the phenomena of the universe with which such men or peoples are vaguely or more thoroughly acquainted.

Primitive man knew more of himself than of other living beings, but this knowledge was vague and imperfect. In his attempt to account for the original activities or properties of the external world not man, his first explanations were based upon analogies with phenomena of his own existence subjectively interpreted. But as man was the most complex being in the known universe of nature, by this method the simple was explained in terms of the complex. Civilized man has discovered that explanation must first be based upon analysis, and that the explanation of the more complex must be a synthesis of the less, in terms of the less.

Early man discovered in himself design and will; discovered that he had the power to plan, to form a purpose, and to execute that purpose. Each individual discovered this in his own actions and in the actions of those with whom he was most intimately associated. So he projected design and will into all of the external universe of his knowledge. He interpreted all motions and changes as teleologic activities. Such a philosophy is called Mythology. This philosophic method passed through many stages, but at every step phenomena that had been mythologically explained came to be correctly explained; that is, along the course of mythologic history there was progress in knowledge, so that philosophies were compounded of mythologic and scientific explanations. As more and more was known, less and less mythologic explanation appeared, until at last, in the early history of civilization, as distinguished from preceding barbarism and savagery, the verity of all mythology was questioned.

As yet, but a small part of the known universe was scientifically explained, and although mythology to a greater or less extent fell into disrepute, there was insufficient real knowlledge to supply its place. By this time man had learned much of language, and it seemed to him a wonderful, almost miraculous, instrument. As all thought is expressed in language, he began to suppose that the basis of thought is language; that the word is not a counter, but a coin. So he began to explain the phenomena of the universe simply as the phenomena of language, and the *names* were the *things*. This was the origin of metaphysic philosophy.

Along with the growth of this philosophy there was an evolution of knowledge—scientific philosophy—until in modern times it has well-nigh displaced both. Knowledge, or science, is the discernment and classification of phenomena as they appear in coexistence and sequence; and when phenomena are thus discerned and classified they are said to be *known*. Such is the nature of scientific opinion. But how do such opinions arise? How is knowledge increased? Manifestly by increasing discernment and classification. Men do not go about the earth indiscriminately discerning and grouping. Psychology teaches us that man subjectively perceives only that which he compares; that is, that discernment and classification go hand in hand and are parts of the same process. He cannot discern without classification, and he cannot classify without discernment. He cannot perceive without comparing, and cannot compare without perceiving. Perception and reflection go hand in hand.

The objective impression may occur without the subjective act of discernment. In order that there be the subjective act, there must also be comparison, and this is dependent upon the constitution of the mind itself.

Such, then, is the nature of knowledge. Every step in the advancement of knowledge is primarily made by the use of a hypothetic explanation. The mind having imagined an explanation of phenomena, tests the value of the hypothesis by more careful discernment and comparison. If the hypothetic explanation be not true, the discernment and comparison have yet led to an increase of knowledge. But there is no increase of knowledge without a precedent hypothesis. All human research, in every particular, is dependent upon antecedent hypothesis; for without some hypothesis there can be neither discernment nor comparison, as objective im-

pressions are not woven into mental structure. Verified hypotheses are scientific opinions, and as they are systematized scientific philosophy is constructed.

An example of the three methods of explaining the same phenomenon will more clearly set forth their characteristics. The Algonkin Indian personifies the north-wind. In his mythology is found the story of the contest between *Ka-bi-bo-no-ki*, the god of the north-wind, and *Shiñgapis*, the ancient of mud-hens. The conflict was a drawn battle, and *Shiñgapis* was not driven from the country. But through the terrible agencies used by the north-wind to destroy *Shiñgapis* all the other birds were driven away. The tradition of this conflict still lives among the birds, and when the north-winds blow in the autumn they leave the country. This is the Algonkin philosophy of the migration of birds.

In metaphysic philosophy birds are said to have an *instinct* of migration, whatever that may be. By giving a name to the phenomenon it is held to be explained. Instinct is a primordial endowment, and the explanation is therefore absolute. If the word connotates any further explanation, as that the instinct was implanted for a purpose, it is mythologic.

Science comes in and explains an instinct as a habit—the growth of a specialized activity; and the growth of such an activity is explained in this manner: Birds, finding their particular habitat no longer congenial by reason of inclement weather and the scarcity of food, one or both conjoined, seek regions of more genial climate and more abundant food. Those more successful, in the long run survive and multiply; those less successful diminish in number and ultimately perish. In this manner a particular habit or activity is developed from generation to generation with any given species, so that it migrates from time to time in search of better climate and more food; and the activity of any given generation of birds is born of the experiences and activities of preceding generations. If such a theory indeed be true, it is a veritable explanation, and belongs to scientific philosophy.

These three systems live side by side even among the same people. In the early history of metaphysics it borrowed largely from mythology; in its latest history it incorporates a large body of science. It is essentially a transition stage of philosophy, bridging the chasm between analogic imagining and homologic reasoning.

Scientific philosophy may, in a broad way, without definite de-

marcation, be set off into three stages. In the first, mechanical phenomena were discerned and classified; molar bodies and their relations were explained by scientific methods. This is the mechanical stage of philosophy. Then discernment and classification extended beyond the direct perception of the senses, by the invention of the telescope, and stellar bodies were discerned and classified. Then by the use of the crucible and the microscope the minute constitution of substances was discovered, and this has led men into the vast domain of chemistry and allied sciences. Thus, in the second stage knowledge is extended outward toward the infinite and inward toward the infinitesimal. This is the stellar and molecular stage of science, when bodies were classified as co-existences and as yet the phenomena of sequence were but imperfectly understood. The most important sequences were first discovered in the astronomic world. Then sequences were discovered in the molecular world of the mineral kingdom. Then finally a great body of sequences were discovered in the biotic world. Early in the history of mankind a few activital sequences were discovered, but at last a great realm of activital sequences are known, and the establishment of the science of evolution marks the third great stage. The second has its beginning far back in the first, and the third has its beginning far back in the second; and yet the three stages are philosophic verities. So also with the general stages of philosophy. Metaphysic philosophy had its beginning far back in mythology, and scientific philosophy had its beginning far back in metaphysics.

The course of evolution as thus set forth may be more succinctly defined in terms of psychology. Philosophy progresses by the progressive discernment of the phenomena of co-existence and sequence, and their relegation from analogic tc homologic categories.

From this brief and too abstract statement of the nature and evolution of philosophy we recognize the fact that opinions, as units, and systematized opinions, as the philosophies which they constitute, result from the mental activity of many men through many generations; and the body of scientific philosophy as it exists to-day is the product of all the mental effort of all the human beings who have existed. It is a vast structure, erected by minute increments. Philosophy is the result of man's struggle to know and his invention of hypothetic explanations, and his choice therefrom of such as discernment and comparison prove true.

EVOLUTION OF MIND.

The evolution of the four great classes of objective activities has thus been set forth. There yet remain for consideration the subjective activities embraced in psychology.

No attempt will here be made to explain the structure of the mind and the course of its evolution. Psychology is a science of great magnitude, embracing on the one hand a consideration of the biotic structure and functions of the nervous system, and on the other the transmutations of objective impressions into subjective sensations, and their transmutation into perceptions and feelings, and then the transmutation of feelings into emotions and emotions into will, and of perceptions into judgments and judgments into opinions, and opinions into designs. Such is the subject-matter of psychology.

Objective activities arise from designs. The vast course of evolution through which the human mind has passed in its highest estate has been due to the reaction of activities upon the mind itself, *i. e.*, the mind has grown through exercise in objective activities. Man is impelled to this exercise by his desire for happiness, and thus he invents arts, institutions, languages, and philosophies. The initial steps in this process are original inventions, and these are taken by the leading minds. Then others follow in these steps by imitation, selecting such inventions as will increase happiness. By this process they re-invent for themselves and, to a large extent exercise the mind in the same psychic activities. This is acculturation. It is the subjective adjustment of the lower to the higher. Finally, activities are objectively diffused by instruction. Parents teach their children. Schools are not confined to civilized man. In every tribe and nation known to man an organized system of instruction is discovered. In an Indian tribe the matron and patriarch of the clan are instructors of the youth, and regularly teach in all the four departments of activities. At stated times the chiefs and councilors of an Indian tribe instruct the young men in the nature of their institutions. At frequently recurring festivals the first hours or first days are devoted to instruction, and the dancing and the feasting occur when the people pass from labor to refreshment. At other times and seasons the medicine men or priests of a tribe systematically instruct their people in philosophy. Thus it is that no tribe has yet been discovered that

has not its organized system of instruction. Psychologic evolution, therefore, the evolution of the individual man, arises through the three agencies—invention, acculturation, and instruction.

Man, prior to the evolution of objective activities, progressed under the methods of biotic evolution, namely, the survival of the fittest in the struggle for existence. But man as an animal is no longer to any appreciable extent dependent upon the biotic method. The exercise of his animal functions is now controlled, to a greater or less extent, by mind in the prosecution of activities; and among the lower and higher races of men the youth are systematically trained in physical exercise. Athletic games and sports designed for physical exercise are born in the lowest savagery and are continued to the highest civilization.

There are three methods of evolution: Evolution in the mineral kingdom is by direct adaptation to environment. Evolution in the biotic kingdom is by indirect adaptation to environment through the survival of the fittest in the struggle for existence. Evolution in the anthropic kingdom is divided into two parts—the evolution of activities, and the evolution of the unit man. In the first, evolution of arts is by invention and the selection of the labor-saving. Evolution of institutions is by invention and the selection of the just. Evolution of language is by invention and the selection of the thought-saving. Evolution of opinions is by invention and the selection of the true. Evolution of the unit man is by invention, acculturation, and instruction, and the environment is adapted to man.

Early in the history of philosophy man in part discovered the laws of human evolution, viz., that part more immediately within his knowledge. But there was always some remote part not thus understood. When, during late years, the processes and methods of biotic evolution were clearly set forth by a host of bioloigsts, and the theories successfully applied to all biologic sciences, it was discovered as inevitable that the same laws must apply to man as an animal. But their application was carried beyond the limits of truth. Man, as a being superior to the lower animals, was supposed to have made progress by the same laws—by the survival of the fittest. No error in philosophy could be more disastrous. And yet this statement is widely accepted. These false doctrines are taught at the highest seats of learning, and are spread broadcast among the people through the press. "The Survival of

the Fittest" is inscribed on the banner of every man who opposes any endeavor to ameliorate the condition of mankind. Only this week have I read in *The Lancet* an apology for physicians because they seek to save life and relieve pain, even among the poor and the despised.

The great biologists themselves have not thus misapplied the principles discovered by them. One of Huxley's most interesting papers sets forth the interdependence of men, and compares anthropic organization to biotic organization, and explains as injury to one class of men is injury to all, in the same manner that injury to one organ of the body is injury to the entire structure. Yet there are many men who from the verge of science are exploiting in sciology, as if man were a beast.

There are many strange transfigurations. It is a wonder that the blows of the hammer are transmuted into heat. It is a wonder that the motions of the ether can be transmuted into the rainbow. It is a wonder that the egg can be transmuted into the eagle. It is a wonder that the babe can be transmuted into the sage. It is a wonder that an objective blow may be transmuted into subjective pain. It is a wonder that the vibrations of the air may be transmuted into melody. It is a wonder that the printed page may be transmuted into visions of the beautiful. But the wonder of wonders is the transfiguration of selfishness into love. Amatory passion transfigured appears as love, parental care as parental love, infantile dependence as filial love, fraternal sympathy as fraternal love. Thus love of kindred was born; and the love of kindred, by the expansion of the kinship body into the tribe and nation, grew to love of country and love of mankind. The last transfiguration in the process of evolution appears as the ethics of mankind.